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REPORT TO CONGRESS
ON
WATER QUALITY

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES and
ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

DIVISION OF WATER

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Special recognition is given to the staff of the Water Quality Branch within the Division of Water for their significant contribution to the preparation of this report. Their dedication and persistence is to be commended. Also, appreciation is given to personnel in the Inventory and Data Management Section of the Permits Review Branch, Groundwater Branch, and Construction Grants Branch. Assistance from the Division of Conservation and the Department of Fish and Wildlife Resources is also greatly appreciated.

EXECUTIVE SUMMARY

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This report was prepared to fulfill requirements of Section 305(b) of the Federal Water Pollution Control Act of 1972 (P.L. 82-500) as amended by the Water Quality Act of 1987 (P.L. 100-4). Section 305(b) requires that states submit a report to the U.S. Environmental Protection Agency on a biennial basis which assesses current water quality conditions. New requirements call for the inclusion of specific data on 1) lake water quality, 2) waters affected by priority pollutants, and 3) waters affected by nonpoint sources of pollution. Other topics that are discussed in the report are groundwater quality, the status of the state water pollution control program, special water quality concerns and recommendations on additional actions necessary to achieve the objectives and goals of the Clean Water Act.

Water Quality Assessment

The water quality assessment of rivers and streams in Kentucky's 1988 report is based on those waters depicted on the 1974 U.S. Geological Survey Hydrologic Unit Map of the state. The map contains about 18,500 miles of streams. Approximately 9,400 miles (51%) of these were assessed, which is a 20 percent increase in coverage from the last report period.

The assessment is based on an analysis of the support of classified uses. Warmwater aquatic habitat and primary contact recreation uses were most commonly assessed. Full support of uses occurred in 6,175.2 miles (66%) of the assessed waters and uses were not supported in 1,722.6 miles (18%). Some degree of use impairment was found in 3,205.2 miles (34%) of the assessed waters. The major causes of use nonsupport were fecal coliform contamination, which affected primary contact recreation use, and siltation, which impaired warmwater aquatic habitat use. The major sources of the fecal coliform contamination were municipal wastewater treatment plant discharges. Surface mining and other unspecified nonpoint sources, were the major sources of siltation.

Pollution due to priority pollutants has occurred in some of the state's streams. Fish consumption warnings have been posted for the Mud River and Town Branch in Logan, Butler and Muhlenberg counties because of the presence of PCBs. A fish consumption advisory is also in effect for the West Fork of Drakes Creek in Simpson

and Warren counties, because of PCBs. Another toxic pollutant which has emerged as a potential health threat is chlordane. Missouri issued a fish consumption advisory for the Mississippi River (which includes a reach bordering Kentucky) because of high chlordane levels in fish tissue. Subsequent investigations by Kentucky and the U.S. Environmental Protection Agency did not detect levels of chlordane that warranted an advisory on the Ohio and Mississippi River along Kentucky's border. Chlordane has been detected in fish tissue at a number of other stream sites in the state.

Section 304(l) of the 1987 amendments to the Clean Water Act requires states to focus attention on waters impaired by toxic pollutants. A preliminary list of affected waters and point source dischargers is required to be submitted as part of each state's 305(b) report. Three preliminary lists; a "short list" of waters affected by point source toxic pollutants, a "mini list" of waters affected by point and nonpoint sources of pollutants, and a "long list" of waters affected by all types of pollutants from all sources, are being submitted as part of the 1988 305(b) report. The short list contains 23 stream segments where individual control strategies for point source dischargers of toxic pollutants must be developed by February 1989. Many of the problems are already being resolved through normal permitting and enforcement programs.

Fifty-three fish kills totalling over 359,000 fish were reported in the past two years, affecting over 81 miles of streams and 247 acres of lakes. Fish kills were most commonly attributed to sewage discharges. Bacteriological surveys were conducted on three stream drainages and at 20 municipal facilities and their receiving streams in 1986-1987. Municipal sewage treatment plant discharges were found to be a major source of recreational use impairment.

The water quality assessment of lakes included more than 90 percent of the publicly owned lake acreage in Kentucky. Fifty of 92 lakes fully supported their uses. On an acreage basis, 84 percent (179,335 acres) of the 214,483 assessed acres fully supported uses.

High iron and manganese concentrations were the greatest cause of use nonsupport in lakes. This was largely because of impacts on domestic water supplies from hypolimnetic water released from large reservoirs which contained excessive levels of iron and manganese. Nutrients were the second greatest cause of use nonsupport and affected the largest number of lakes. Natural sources of nutrients

nonsupport and affected the largest number of lakes. Natural sources of nutrients were responsible for the largest percentage of nonsupport (64%) followed by nonpoint sources (25%). Surface mining and unspecified nonpoint sources accounted for the greatest impacts from nonpoint sources.

An analysis of lake trophic status indicated that of the 92 lakes, 51 were eutrophic, 27 were mesotrophic and 14 were oligotrophic. Carr Fork Lake showed an improvement in water quality while Reformatory Lake, which had shown previous improvement, was categorized as not supporting warmwater aquatic habitat use. Cave Run Lake water quality is changing because of an increase in chloride concentration attributed to oil and gas activities in its watershed. Impacts on aquatic life are not yet apparent, but the threat from brine pollution is a cause of concern. An assessment of three lakes monitored specifically for acid deposition impacts revealed no discernible trend toward acidification.

The Nonpoint Source (NPS) Pollution Assessment Report consists of a list of surface waters, groundwaters, and wetlands in Kentucky impacted by nonpoint source pollution. In addition, the categories and subcategories of sources of NPS pollution for each of the listed waterbodies were identified. The information for the NPS pollution assessment was gathered from many different sources and with the coordination and cooperation of federal, state and local agencies. The Division of Water and cooperating agencies and organizations will prioritize the waters according to the severity of NPS pollution, which will be required for the development of a statewide NPS Management Program Plan. The NPS Management Program Plan will outline Kentucky's nonpoint pollution control program and will include education programs, demonstration projects and technical assistance to encourage the use of appropriate best management practices.

With some exceptions, the quality of Kentucky's groundwater is good. Special studies were conducted in 1987 on 199 wells in the Gateway Area Development District and the Calvert City area. Isolated occurrences of fecal coliform contamination were found and attributed to faulty well construction. No significant cases of organic contamination were found. While these studies point out the good quality of the groundwater in these areas, other statewide problems remain to be solved. Impacts from sanitary landfills, domestic on-site sewage treatment, inconsistencies in federal and state laws regarding groundwater, and improperly abandoned wells, are areas of concern relative to groundwater protection.

Special State Concerns

The discharge of brines to Kentucky waters remains a serious problem, particularly in portions of the Licking and Kentucky river drainages. Significant improvements in water quality in parts of the Blaine Creek drainage resulted from the application of newly promulgated federal chloride criteria to oil and gas permitting actions. Continuation of the permitting activities should significantly improve water quality in the other areas impacted by brine pollution.

The loss of wetland resources and adverse impacts to remaining wetland areas are of concern. It is estimated that half of Kentucky's original wetland acreage is gone. Nearly all of the remaining areas have been degraded by pesticides, acid mine drainage, siltation, oil brine, or domestic and industrial waste. A major threat to Kentucky wetlands is destruction by competing land use activities and poor land management practices.

The state, through the authority of the Clean Water Act, issues a Section 401 water quality certification for activities which require a federal permit or license. Issues of concern have to do with the appropriate and potential use of certification. Federal guidance on conditions that can be put on certifications, how to handle after-the-fact permits, and how to apply certification to activities which impact wetlands, is needed.

Water Pollution Control Programs

Kentucky's water pollution control programs have expanded to develop some new approaches to controlling pollution. Biomonitoring requirements are beginning to be incorporated into permits for major municipalities and industries. A state revolving fund program has been proposed to meet the needs of new wastewater treatment plant construction and, because needs far exceed available resources, innovative approaches are being developed to contain costs. These include streamlining or reducing requirements in funding projects, assisting small communities in their planning process and simplifying bidding, construction and change order activities.

Forty-five primary ambient monitoring stations, which characterized approximately 1,500 stream miles within the state were in operation during the

reporting period. This was an expansion of six stations over the past two years. Biological monitoring was expanded from 22 stations to 33. In addition, eight lakes were sampled for eutrophication trends and three lakes for acid precipitation trends. Four intensive surveys were conducted on 267 miles of streams for the evaluation of industrial pollution, surface mining, and oil production activities on water quality and assessing use attainability.

WATER WATCH, a citizen education program, expanded its membership and more than doubled the number of waters "adopted" by local groups. A water quality monitoring project was initiated which produced data on stream water quality at 57 sites across the state. The program gained international recognition when it received the North American Environmental Education Association's 1987 award for outstanding service to environmental education.

An approach to developing a wetlands protection strategy for Kentucky was formulated over the past reporting period. The Kentucky Environmental Quality Commission assisted the Natural Resources and Environmental Protection Cabinet by acting as the lead agency in producing the strategy development mechanism for the Cabinet. A report was produced recommending a phased approach which included 1) legislative actions to establish a wetlands planning committee and provide for various funded activities, such as mapping and hiring of a coordinator, 2) establishment of a natural area and wetlands acquisition fund, and 3) through the wetlands planning committee, development and implementation of the protection strategy.

The groundwater program expanded during the last reporting period from a Section level to a Branch level unit with two sections. The Technical Services Section has responsibilities for wellhead protection, monitoring well and water well inspections, and implementing groundwater regulations. The Data Management and Support Section has responsibilities for coordinating the various groundwater programs in the state, and developing data management capabilities and groundwater regulations. A regulatory scheme for groundwater is being developed which will mirror the federal model.

BACKGROUND

BACKGROUND

This report was prepared to fulfill the requirements of Section 305(b) of the Federal Water Pollution Control Act of 1972 (P.L. 92-500) as amended by the Clean Water Act of 1987 (P.L. 100-4). Section 305(b) requires that states submit a report to the U.S. Environmental Protection Agency (EPA) every two years which addresses current water quality conditions. Items to be addressed in the report include an assessment of the degree to which nonpoint sources of pollutants affect water quality, an assessment of state groundwater quality, an assessment of the extent to which the state's waters meet their designated uses and the fishable/swimmable goals of the Act, and recommendations on additional actions necessary to achieve the water quality objectives of the Act. New requirements call for the inclusion of specific data on lake water quality, waters affected by nonpoint sources and waters affected by toxics. EPA uses the reports from the states to apprise Congress of the current water quality of the Nation's waters and recommends actions which are necessary to achieve improved water quality. States use the reports to provide information on water quality conditions to the general public and other interested parties.

This report follows the guidance document that EPA provided to the states for the 1988 report. The stream water quality in this report is based on those streams shown on the U.S. Geological Survey's Hydrologic Unit Map of Kentucky (scale 1:500,000). The assessments were based on this map's approximately 1,300 streams and rivers which contain about 18,500 stream miles. Kentucky is divided into 42 cataloging units, which compose the 12 river basins assessed in this report. These drainage basins from east to west are the Big Sandy, Little Sandy, Tygarts, Licking, Kentucky, Upper Cumberland, Salt, Green, Tradewater, Lower Cumberland, Tennessee and Mississippi. The Ohio River Valley Water Sanitation Commission (ORSANCO) compiles a report on the Ohio River which is used as a supplement to the 305(b) reports submitted by the member states of the Commission. The assessment of lake conditions is based largely on data collected by the Division of Water in 1981-1983 under the Federal Clean Lakes Program. More recent data were utilized, when available, to update that information base. The 92 lakes which were assessed have a total area of 214,483 acres. This includes the Kentucky portions of Barkley, Kentucky and Dale Hollow lakes which are border lakes with Tennessee. Total wetland acreage in Kentucky has not been accurately determined. The Division of Water, in collaboration with the Kentucky Department of Fish and Wildlife Resources, has contracted with the U.S. Fish and Wildlife Service to map wetlands in the Commonwealth.

Kentucky's population, according to the 1980 census, is 3,660,257. The state has an approximate area of 40,598 square miles. It is estimated that there are approximately 40,000 miles of streams within the borders of Kentucky, which ranks the state seventh in total length of streams within the contiguous United States. Kentucky has 849 miles of border rivers. The northern boundary of Kentucky is formed by the low water mark of the northern shore of the Ohio River and extends along the river from Catlettsburg in the east to the Ohio's confluence with the Mississippi River near Wickliffe in the west (a length of 664 miles). The southern boundary is formed by an extension of the Virginia-North Carolina 1780 Walker Line which extends due west to the Tennessee River. Following the acquisition of the Jackson Purchase in 1818, the 30°36' parallel was accepted as the southern boundary from the Tennessee River to the Mississippi River.

Kentucky's eastern boundary begins at the confluence of the Big Sandy River with the Ohio River at Catlettsburg and follows the main stem of the Big Sandy and Tug Fork southeasterly to Pine Mountain, for a combined length of 121 miles; then follows the ridge of the Pine and Cumberland mountains southwest to the Tennessee line. The western boundary follows the middle of the Mississippi River for a length of 64 miles and includes several of the islands in the Mississippi channel.

The climate of Kentucky is classified as continental temperate humid. Summers are warm and humid with an average temperature of 76°F, while winters are moderately cold with an average temperature of 34°F. Annual precipitation averages about 45 inches, but varies between 40 to 50 inches across the state. Maximum precipitation occurs during winter and spring with minimum precipitation occurring in late summer and fall.

Summary of Classified Uses

Kentucky lists waterbodies according to specific uses in its Water Quality Standards Regulations. These uses are: 1) Warmwater Aquatic Habitat, 2) Coldwater Aquatic Habitat, 3) Domestic Water Supply, 4) Primary Contact Recreation, 5) Secondary Contact Recreation and 6) Outstanding Resource Waters. Those waters not specifically listed are classified (by default) for use as warmwater aquatic habitat, primary and secondary contact recreation, and domestic water supply. The domestic water supply use is applicable at points of withdrawal. Lakes have not been listed in the regulations and are classified for the default uses. The Division of Water adds waterbodies to the classified lists as an ongoing process in its revision of water quality standards. Intensive survey data and data from other studies when applicable are used to determine appropriate uses. Currently, 1,683 stream miles are classified as warmwater aquatic habitat, 384.4 miles as coldwater aquatic habitat and 206.7 miles as outstanding resource waters. There are approximately 104 points where domestic water supply is withdrawn in streams, and there are 54 lakes which are used for domestic water supply purposes.